

# Safety Data Sheet



## 1: Identification

### 1.1: Product Identifier

Product Name: HfI4

Product Number(s): 1HF14-0001F

CAS Number: 13777-23-6

SDS Document Number: 000116

### 1.2: Recommended Uses and Restrictions

Recommended Uses

Manufacture of substances

Restrictions

Not for food or drug use.

### 1.3: Supplier Contact Information

APL Engineered Materials, Inc.

2401 N. Willow Rd.

Urbana, IL 61802

Phone: 217-367-1340

Fax: 217-367-9084

### 1.4: Emergency Phone Number

United States: 800-255-3924

International: +01-813-248-0585

## 2: Hazards Identification

### 2.1: Classifications

Eye Damage/Irritation - Category 1

Skin Corrosion/Irritation - Category 1B

### 2.2: GHS Label Elements

Pictograms



Signal Word: Danger

Hazard Statements

H314: Causes severe skin burns and eye damage.

H318: Causes serious eye damage.

Precautionary Statements

P260: Do not breathe dust.

P264: Wash hands thoroughly after handling.  
 P280: Wear protective gloves, clothing, and eyewear.  
 P303 + P361 + P353: IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.  
 P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
 P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P310: Immediately call a POISON CENTER or doctor/physician.  
 P363: Wash contaminated clothing before reuse.  
 P405: Store locked up.  
 P501: Dispose of contents/container to licensed disposal facility.

2.3: Hazards Not Otherwise Classified or Not Covered by GHS

None.

2.4: Amount(s) of substances with unknown toxicity

None

**3: Composition/Information on Ingredients**

3.1: .Ingredient	.Weight%	.Formula	.CAS Number	.Mol Wt	.EC Number
HfI4	100	HfI4	13777-23-6	686.11	not assigned

3.2: Other Hazardous components

none

3.3: Trade Secret Disclaimer

none

3.4: Synonyms

Hafnium (IV) Iodide  
 Hafnium tetraiodide

**4: First Aid Measures**

4.1: First Aid

General

Remove person from area of exposure and remove any contaminated clothing  
 Consult with physician and provide this Safety Data Sheet

In contact with eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids.  
 Seek medical attention if irritation develops or persists

In contact with skin

Wash thoroughly with soap and plenty of water. Remove all contaminated clothing for proper laundering. Seek medical attention if irritation develops or persists.

If swallowed

If conscious and alert, rinse mouth and drink 2-4 cupfuls of water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting. Get medical aid.

If inhaled

Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid.

If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

#### 4.2: Most important symptoms and effects; acute and delayed

Causes severe eye damage.

Inhalation may cause burning sensation, coughing, wheezing, laryngitis, shortness of breath, inflammation and edema of the larynx, spasms, inflammation and edema of the bronchi, pneumonitis, or pulmonary edema.

Causes severe burns.

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

#### 4.3: Indication of any immediate medical attention and special treatment needed

If inhaled : Immediately call a POISON CENTER or doctor/ physician.

If in Eyes: Immediately call a POISON CENTER or doctor/ physician.

If swallowed: Immediately call a POISON CENTER or doctor/ physician.

### **5: Fire Fighting Measures**

#### 5.1: Fire extinguishing media

dry chemical

carbon dioxide

water or alcohol-resistant foam

#### 5.2: Specific hazards arising from the substance or mixture

hydroiodic acid and hydroiodic acid fumes

hafnium oxide

#### 5.3: Special protective equipment and precautions for firefighters.

Wear self contained breathing apparatus for fire fighting if necessary

### **6: Accidental Release Measures**

#### 6.1: Personal precautions, protective equipment, and emergency procedures.

Ensure adequate ventilation.

Avoid breathing dust.

For personal protection see section 8.

Avoid dust formation.

Use personal protective equipment.

Evacuate personnel to safe areas.

#### 6.2: Methods and materials for containment and cleaning up.

Keep in suitable, closed containers for disposal.

Sweep up and shovel.

#### 6.3: Environmental precautions

Do not let product enter drains.

#### 6.4: Disposal

See section 13.

Dispose of in accordance with local regulations.

## **7: Handling and Storage**

### **7.1: Precautions for safe handling**

Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

Avoid contact with skin and eyes.

See precautionary statements in section 2.2.

### **7.2: Conditions for safe storage**

Store in the dark to preserve product quality.

Store under inert gas.

Store away from moisture.

Keep container tightly closed.

Store in a dry and well-ventilated place.

### **7.3: Incompatibilities**

strong oxidizing agents

moisture sensitive

## **8: Exposure Controls/Personal Protection**

### **8.1: Control parameters**

OSHA permissible exposure limit (PEL)

0.5 mg/m<sup>3</sup> (as Hf)

ACGIH threshold limit value (TLV)

0.5 mg/m<sup>3</sup> (as Hf)

NIOSH recommended exposure limit (REL)

0.5 mg/m<sup>3</sup> (as Hf)

### **8.2: Engineering controls**

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower

Use adequate ventilation to keep airborne concentrations low

### **8.3: Personal protective equipment**

Eyes

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166

Skin

Wear appropriate, chemical-resistant protective gloves to prevent skin exposure.

Clothing

Wear appropriate protective clothing to prevent skin exposure

Respirator

Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149.

Always use a NIOSH or European Standard EN 149 approved respirator when necessary

## 9: Physical and Chemical Properties

### 9.a: Appearance

State: Solid

Form: powder or spheres

Color: Yellow

9.b: Odor: no data available

9.c: Odor threshold: no data available

9.d: pH: no data available

9.e: Melting point / freezing point: 400 °C (752 ° F)

9.f: Initial boiling point and range: no data available

9.g: Flashpoint: no data available

9.h: Evaporation rate: no data available

9.i: Flammability (solid, gas): no data available

9.j: Upper/lower flammability or explosive limits: no data available

9.k: Vapor pressure: no data available

9.l: Vapor density: no data available

9.m: Relative density: 5.6 g/cm<sup>3</sup> at 25 °C (77 °F)

9.n: Water Solubility: Decomposes in water

9.o: Partition coefficient: n-octanol/water: no data available

9.p: Auto-ignition temperature: no data available

9.q: Decomposition temperature: no data available

9.r: Viscosity: no data available

## 10: Stability and Reactivity

### 10.1: Reactivity

Reacts with water

### 10.2: Chemical stability

Stable under recommended storage conditions.

### 10.3: Possibility of hazardous reactions

no data available

### 10.4: Conditions to avoid

exposure to water

In the event of fire: see section 5

### 10.5: Incompatible materials

See section 7.3.

### 10.6: Hazardous decomposition products

In the event of fire: see section 5.2

Other decomposition products - no data available

## 11: Toxicological Information

### 11.1: Toxicity data

Acute toxicity - Oral

no data available

Acute toxicity - Dermal

no data available

Acute toxicity - Inhalation

No data available.

Skin corrosion/irritation

Causes severe skin damage.

Eye damage/irritation

Causes serious eye damage

Respiratory irritation

No data available.

Germ cell mutagenicity

no data available

Reproductive toxicity

no data available

Specific organ toxicity - single exposure

No data available.

Specific organ toxicity - repeated exposure

No data available.

Aspiration hazard

No data available.

Additional information

No data available.

ACGIH carcinogenicity

The ACGIH has not identified any component of this product present at levels greater than or equal to 0.1% as a probable, possible or confirmed human carcinogen.

IARC carcinogenicity

The IARC has not identified any component of this product present at levels greater than or equal to 0.1% as a probable, possible or confirmed human carcinogen.

NTP carcinogenicity

The NTP has not identified any component of this product present at levels greater than or equal to 0.1% as a probable, possible or confirmed human carcinogen.

OSHA carcinogenicity

OSHA has not identified any component of this product present at levels greater than or equal to 0.1% as a probable, possible or confirmed human carcinogen.

### 11.2: Routes of exposure

skin

oral

eyes

### 11.3: Symptoms of exposure

See section 4.2

### 11.4: Delayed and immediate effects of exposure

There are reports of liver damage from hafnium exposure

To the best of our knowledge the toxicological properties have not been thoroughly investigated.

## 12: Ecological Information

### 12.1: Ecotoxicity

Toxicity to fish

No data available

Toxicity to daphnia and other aquatic invertebrates

No data available

Toxicity to algae/bacteria

No data available

### 12.2: Persistence and degradability

no data available

### 12.3: Bioaccumulative potential

no data available

### 12.4: Mobility in soil

no data available

### 12.5: Other effects

no data available

## 13: Disposal Considerations

### 13.1: Waste treatment methods

No data available

### 13.2: Safe handling

See section 7.1 .

### 13.3: Product disposal

Contact a licensed professional waste disposal service to dispose of this material.

### 13.4: Packaging disposal

Dispose of as unused product.

## 14: Transport Information

### 14.1: DOT(US)

UN Number: 3260

Proper Shipping Name: Corrosive solid, acidic, inorganic, n.o.s. (Hafnium iodide)

Packing Group: II

Shipping Class(es): 8

Marine Pollutant: No

#### 14.2: IMDG

UN Number: 3260

Proper Shipping Name: Corrosive solid, acidic, inorganic, n.o.s. (Hafnium iodide)

Packing Group: II

Shipping Class(es): 8

Marine Pollutant: No

#### 14.3: IATA

UN Number: 3260

Proper Shipping Name: Corrosive solid, acidic, inorganic, n.o.s. (Hafnium iodide)

Packing Group: II

Shipping Class(es): 8

#### 14.4: Special Shipping Precautions

None

### 15: Regulatory Information

#### 15.1: TSCA inventory

This material is listed on the TSCA inventory.

#### 15.2: SARA 302 components

This material is not subject to the reporting requirements of SARA Title III, Section 302.

#### 15.3: SARA 313 components

This material is not subject to the reporting requirements of SARA Title III, Section 313.

#### 15.4: SARA 313/312 hazards

Acute health hazard.

#### 15.5: Other information

Massachusetts Right To Know Components - This product does not contain materials listed on the Massachusetts Right to Know list

New Jersey Right To Know Components -This product does not contain materials listed on the New Jersey Right to Know list

California Prop. 65 Components - This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Pennsylvania Right To Know Components -This product does not contain materials listed on the Pennsylvania Right to Know list

### 16: Additional Information

#### 16.1: NFPA

Health: 2

Fire: 0

Reactivity: 1

Special:

#### 16.2: HMIS

Health: 2

Chronic:



Flammability: 0

Physical Hazard: 0

### 16.3: Disclaimers

For industrial use only. Not for drug, household or other uses

The information herein is believed to be accurate and reliable as of the date compiled. However, APL Engineered Materials, Inc. makes no representation, warranty, or guarantee of any kind with respect to the information on this data sheet or any use of the product based upon this information.

### 16.4: References

Information contained on this SDS sheet was obtained from some or all of the following sources: American Conference of Governmental Industrial Hygienists (ACGIH), TLVs and BEIs; National Institute for Occupational Safety and Health (NIOSH), Pocket Guide to Chemical Hazards; European Chemicals Agency, <http://echa.europa.eu/>; The National Institute of Health, U.S National Library of Medicine, TOXNET, Toxicology Data Network; and the Registry of Toxic Effects of Chemical Substances (RTECS) database.

### 16.5: Version

Preparation Date: 5/22/2015

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Version Number: GHS 1.0